

REMARKS

Favorable reconsideration of this application is respectfully requested.

The specification is amended to make minor changes and to include suggested headings.

Claims 1-20 are pending in this application. Claims 1-2, 7-8, 11-14, and 18-20 were rejected under 35 U.S.C. §103(a) as unpatentable over U.S. patent 4,745,610 to Yoshikawa in view of U.S. patent 6,078,204 to Cooper et al. (herein “Cooper”). Claim 4 was rejected under 35 U.S.C. §103(a) as unpatentable over Yoshikawa in view of Cooper, and further in view of U.S. patent 5,521,414 to Palara and U.S. patent 6,617,906 to Hastings. Claims 3 and 15 were objected to as dependent upon a rejected base claim, but were noted as allowable if rewritten in independent form to include all of the limitations of their base claim and any intervening claims.

Initially, applicant gratefully acknowledges the early indication of the allowable subject matter in claims 3 and 15.

Addressing now the rejection of claims 1-2, 7-8, 11-14, and 18-20 under 35 U.S.C. §103(a) as unpatentable over Yoshikawa in view of Cooper, and the further rejection of claim 4 further in view of Palara and Hastings, those rejections are traversed by the present response.

Applicant respectfully submits the applied combination of teachings does not fully meet each of the claim limitations.

The present inventor found that in a device such as shown in Figure 16 of the present specification a leak current is generated when using a series rectifying circuit including a plurality of rectifying elements, such as zener diodes 1, connected in series under light irradiation.¹

¹ See also the present specification at page 6, line 23 to page 9, line 25.

In view of that recognition by the present inventor, the device such as shown in Figure 1 in the present specification was realized. In that device as shown in Figure 1 a series rectifying circuit includes a plurality of first rectifying elements, e.g. zener diodes 1, connected in series, and additionally includes a second rectifying element, e.g. diode 12, whose anode is connected to an anode of the series rectifying circuit, i.e., whose anode is connected to the anode of a zener diode 1.

With such a construction, even if the series rectifying circuit is irradiated by light, any leak current that flows into the series rectifying current can be intercepted by the rectifying element whose anode is connected to the anode of the series rectifying circuit.²

The present invention is thus relevant in a device in which a plurality of first rectifying elements are connected in series, as in such a device the above-noted leak current is generated, particularly in an optical semiconductor device including a semiconductor element with the plurality of first rectifying elements connected in series.

With respect to the applied art, applicant first notes the primary applied reference to Yoshikawa differs from the claims in that it does not even disclose a plurality of first rectifying elements connected in series. As a result, the device of Yoshikawa does not even suffer from the drawback of leak current such as in the device in Figure 16, which the present invention addresses.

In further detail, the outstanding rejection relies on Yoshikawa disclosing zener diodes 41 and 42 for example in Figure 3 to correspond to the claimed “series rectifying circuit including a plurality of first rectifying elements [or specifically zener diodes as in claim 1] connected in series”. However, as clearly shown in Figure 3 in Yoshikawa those zener diodes 41 and 42 are ***not connected in series***, but instead are connected in parallel. As a result, the above-noted problem leak of current which the present invention can address is

² See also for example the present specification at page 10, lines 10-14.

not even generated in the device in Yoshikawa. Thus, Yoshikawa does not disclose the above-noted claimed features of “a series rectifying circuit including a plurality of zener diodes connected in series”, as recited in independent claim 1, or a “series rectifying circuit including a plurality of first rectifying elements connected in series”, as recited in independent claim 13, in contrast to the position for the rejection.

Moreover, no teachings in Cooper can overcome the deficiencies in Yoshikawa.

In Cooper a clamp circuit of Cooper is directed to a protection circuit in a power application, for example as noted in Cooper at column 1, lines 11-19. As a result, the device of Cooper also does not suffer from a problem of leak current as discussed above caused by an optical semiconductor element.

Moreover, applicant respectfully submits one of ordinary skill in the art would not have combined the teachings of Yoshikawa and Cooper. Such devices are directed to different elements that have no commonality. As noted above, neither Yoshikawa nor Cooper even address a problem resulting from leak current, particularly as Yoshikawa would not suffer from such a problem. Further, neither Yoshikawa nor Cooper disclose or suggest a solution to such a problem as in the present invention of further including a rectifying element with an anode connected to an anode of a series rectifying circuit of first rectifying elements or of a plurality of zener diodes; that structure in the present invention addressing the leak current problem discussed above.

Applicant also notes the only motivation set forth in the Office Action to combine the teachings of Cooper and Yoshikawa is “to protect the semiconductor element load as disclosed in Cooper”. However, Yoshikawa does not disclose the same type of structure as in Cooper, and does not appear to be directed to a device that would require protection of a semiconductor element load such as in Cooper. Thus, clearly there can be no incentive or

motivation to one of ordinary skill in the art to combine the teachings of Yoshikawa and Cooper, absent an improper hindsight reconstruction of applicant's invention.

In view of these foregoing comments, applicant respectfully submits the claims as currently written distinguish over Yoshikawa in view of Cooper.

Moreover, no teachings in Palara or Hastings can overcome the above-noted deficiencies of Yoshikawa in view of Cooper.

In view of these foregoing comments applicant respectfully submits claims 1-20 as currently written distinguish over the applied art.

As no other issues are pending in this application, it is respectfully submitted that the present application is now in condition for allowance, and it is hereby respectfully requested that this case be passed to issue.

Respectfully submitted,

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